A Method of Keeping and Breeding Land Hermit Crabs

By Stu Wools-Cobb

Foreword:

Hello. My name is Vanessa Pike-Russell. Stu Wools-Cobb visited my website on land hermit crab care and emailed me after reading my caresheet on gender and reproduction. At the time it had been unheard of for land hermit crabs to have successfully reproduced in captivity and the resulting eggs raised to juvenile (air-breathing) stage of development.

A few emails, phone calls later, and Stu sent me a copy of his booklet that was created in part for his local aquarist society. Through his extensive background in breeding fish and raising brine shrimp he was able to raise the hermit crab zoea with the materials he had on hand (see pages 10-12) and fed them a diet rich in nutrients similar to those they would have access to in the intertidal pools of the wild. A steady routine of hand-feeding every two hours contributed to his success – and it is his desire to share his knowledge and success with other land hermit crab enthusiasts with the hope that others will obtain similar results.

It would be greatly appreciated that if you utilise the information given in this document (and discussions online based on its contents) that you could document as carefully as possible the process you use and the results you achieve; either success or failure. It is also highly helpful if you are able to attempt some photographic and anecdotal journaling to continue to add to the pool of knowledge related to breeding and raising land hermit crabs in captivity.

Discussions

http://www.crabstreetjournal.com/modules.php?name=Forums&file=viewtopic&t=5185

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A METHOD OF KEEPING & BREEDING

LAND-BASED HERMIT CRABS

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The land-based hermit crabs generally available in Australia are *Coenobita olivieri*, and come from the north coast of Western Australia. Although they are land-based, once they breed they enter the ocean to release their eggs. The free-swimming larval stages eventually attain their tiny crab-like form, find a small shell and move up from the beach onto the land. * *C. olivieri/variabilis*?

Once on the land, they breathe by means of modified gills and these must be kept damp at all times, hence the constant need for water.

These crabs are not normally bred in captivity due to the requirement of the ocean for the larval stages. The crabs cannot be sexed unless they are out of their shells and, as they have a very firm hold on these, they would be torn apart if this were attempted.

The land hermit crab's requirements are detailed below.

These are:

A container that they can't climb out of. (They can climb up the silicon in a fish tank corner.)
A cover to keep the crabs and the humidity inside.
Fresh water - daily, to drink.
Salt water, to bathe in.
Food, in very small portions, which they usually eat at night.
Warmth; they are tropical animals. (25 - 32°C)
A place to hide in during the day, (they are mainly nocturnal); and while they are moulting.

Something to climb on; they are tree climbers in the wild.
Some larger shells.

Their container can be a fish bowl, fish tank or anything similar that you can see into and that the crabs can't get out of. Worked on a base area of about 15cm squares, (6 inch squares), for each crab. A two foot fish tank would house about 5 or 6 medium-sized crabs.

The cover should be close-fitting and may need to be vented down one end, (mosquito netting in a frame), so that the humidity can be adjusted.

Drinking water - fresh daily - in a container that the crabs can climb into without tipping it over, and can climb out of again.

Bathing water can be made up from a shop-bought salt mix, by using rock salt, or use straight sea water. If using rock salt, mix 4 heaped teaspoons of salt with one litre of fresh water and store any excess for later.

If readily available, the crabs will spend more time in the salt water than in the fresh. They can stay submerged for five or sometimes ten minutes, but must be able to get in and out easily or they will drown. Land hermit crabs need salt water to maintain their internal chemical balance. If it is available on a continual basis, the crabs may use the bath several times daily.

Land hermit crabs will eat almost anything, but in very small portions. The food should be placed in a shallow bowl and more will be wasted than is consumed. As with any animal, variety is the key to success.

Besides commercially available crab pellets, they will eat any of the tropical fish foods, raw crushed peanut, bread, banana, apple, lettuce, or table scraps such as a crushed boiled pea, pumpkin, or fish. A fingernail size piece of several choices for half a dozen crabs is plenty. They will also nibble on cuttle fish and charcoal.

If the humidity is high, (as it should be), the food will 'go off' within two days and must be replaced.

Warmth can be a problem depending on where you live and whether you have heating in the house during winter. The reason most people lose their hermit crabs is because they get cold. If they are kept at a temperature under 20°C for more than a few days they will die.

Besides normally controlled room heating, some publications recommend using a small wattage lamp as a heat source. This would need to be temperature controlled and would mainly be needed at night when it it colder. At night time, however, the crabs should be in darkness, or nearly so.

An under-base heating pad can be used to heat the centre portion of the crab container, or a heater can be made up to suit the layout. This should be of low voltage for safety. (see note at end of article for details).

A cave or darkened area should be available for the crabs to retreat to during the day. In nature, the crabs dig holes in the sand; so a slightly damp sand base is necessary. Washed beach or river sand is ideal. The sand should be just damp enough so that after you have poked your finger in it - the hole remains in the sand.

Drift wood, suitably arranged, for the crabs to climb on and hide under serves a couple of purposes but must be solidly supported so that it doesn't collapse and crush them. The crabs will nibble on the wood, and, if it has a burnt end, on the charcoal also.

New shells. Crabs moult, at least once each year. To do this they retract into their shell, slowly leaving behind their complete outer covering, head, legs, claws and all. They are now, of course, much smaller, but as their new outer covering fills out and hardens, (over a few weeks), they get much bigger and may end up too large for their existing shell.

Although crabs will use whatever housing they must, they can be very fussy. Their shell should be big enough so that when the crab is fully retracted, its larger claw, (the left one), covers the shell opening. They can swap from shell to shell in a flash, but may not be happy with the new one and swap back and forth several times.

Hermit crabs can be very easily killed by disturbing them whilst they are moulting and for some weeks afterwards. It may appear that the crab has died, with its body hanging out lifeless, but underneath in the shell the new outer covering is developing. Many poor crabs have been thrown out whilst in this condition. The crab will usually eat most of this old covering, (as a source of calcium), leaving only the claws behind.

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If properly set up in the first place, the only attention that land-based hermit crabs need is regular food and water. The sand should be washed out and part-dried once a month or so, and, if you can use a filtered water system, both waters only need replacing monthly.

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BREEDING.

Assuming the conditions are suitable, as detailed above, the adult crabs need to have sufficient moving sea water to convince them that they have a little opening to the ocean available to them. (Crabs are rated fairly low on the intelligence scale, and the use of actual sea water in sufficient quantity fools them).

In a set-up that has proved successful, the salt bath holds two litres with a further two litres in the filter and pump sump. (see diagram). The return water sprays onto the side glass sufficient to cause some disturbance to the salt bath. This aerates the water as it runs in a thin film down the glass. The bath and sump water are changed each 6–8 weeks, without disturbing the bio-filter.

The fresh water set-up is identical.

The outlet to the filter and pump on the salt water side is covered with a fine nylon mesh.

In the breeding season that this article is based on, success occurred on the 9th and 14th of January, and the 12th of February, so it would seem that everything would need to be in place from the beginning of January to the end of February.

In each case above, the eggs were deposited in the salt water bath during the night under the illumination of a dim 'night-light' placed to give

a faint light to several fish tanks and the 'crabarium'. Neither the eggs nor the egg casings were sighted, they presumably dissolved in the salt water within a few hours.

RAISING.
The larvae are white to clear coloured and partly curled up for the first day, and are about 5mm long, (see drawing).

They need to be siphoned out within a day or so of hatching and placed in a tank with similar water conditions, (temperature and salinity).

Tank set-up. A standard 2 foot tank with 54 litres (12 gallons) of sea water at the same temperature as the salt water bath and aerated moderately will house about 200 -300 larvae. (A medium sized crab will lay about 150 -200 eggs).

The tank needs to have been set up some time prior to the event and a good culture of 'green water' and marine infusoria established. Glass covers should be fitted so that the condensation returns to the tank.

Once the larvae have been transferred to this tank, the temperature should be raised by adjusting the heater to about 28°C.

The larvae will drift in the current and gather on the bottom in the still water areas. They appear to feed both in mid-water and in the mulm on the bottom. Unless it is essential due to overfeeding, the accumulating mulm should not be removed as this contains food for the tank micro-life, and also some of the larvae. *4

At this stage a second tank needs to be set up ready for the next stage of development.

From the second day the larvae hang head-down against the side of the tank or swim back and forth, still in the head-down position.

At about day seven the larvae develop legs, including spindly front

claws, from the previous stumps, and a curled tail flap, and are now identical to a tiny shrimp, (see drawing). These are identified as Stage 2.

The larvae now move about in an upright posture, drifting in the current, moving forwards and carrying out sudden back-flips.

They are now cannibalistic and will attack and eat any Stage 1 larvae that they find.

For this reason, as each larvae reaches Stage 2, (and it occurs individually over a period of about one week), they must be separated from those less developed if a maximum survival rate is to be obtained. They should be siphoned out as they drift about in mid-water and placed in the second tank.

Second tank set-up. This can be a similar sized tank, (2ft), but must have a ramp and out-of-water platform, (see diagram).

This tank, set up some time before with similar water conditions of temperature and salinity, can be 'seeded' with some mulm from the first tank.

Ideally, the tank should contain some sea-grass planted in fine sand, over half the bottom. This gives the larvae something to hang on to, (which they seem to need to do), something to feed off, (as the mulm settles on the leaves), and helps to keep them separated.

Prior to putting in the Stage 2 larvae, put in some newly-hatched brine shrimp, *(Artemia)*, and a pinch of powdered Spirolina. Continue adding brine shrimp and Spirolina for seven days after the last of the Stage 2 larvae have been added to the tank. Frozen zooplankton fish food, freshly thawed, should also be added each day at the rate of about one teaspoon full per hundred larvae.

From day fourteen onwards, a selection of tiny shells must be available. Conical shells, 5-7mm long, can be placed on the bottom at the base of the ramp. (Some store-bought supplies of coarse shell grit contain ideal size shells).

During the next 3 to 7 days the first of the larvae will start accepting shells, (Stage 3), and will climb out of the water for short periods. They will automatically head uphill in an effort to get free from the water. They will climb the silicon sealant in the tank corners if there is no other way out. From this stage on they are quite hardy and there should be no further losses.

Usually between the period 21 to 28 days, the juvenile crabs establish themselves permanently on land. (Stage 4).

At this stage, as in the tank, they must have only fine-grained sand to crawl over. Sand with a larger grain would make it too hard for them to drag their newly gained weight. Very fine white sand also makes it easier to see the individual little crabs as they move about.

On the platform they also need some shelter in the form of old dried leaves, and a very shallow fresh water container. Some fine powdered food can be sprinkled over the surface of the sand, but only a tiny amount.

The juvenile crabs can now be picked up, (a pair of plastic tweezers does the job), and placed in their new home.

Third tank set-up. A plastic fish bowl makes an ideal home for the tiny crabs as it has no seams for them to climb up, and out. A 14 inch bowl, completely set up will comfortably hold about 20 of them. A large shallow moulded plastic tank would also be suitable.

Requirements:
Fine sand.
Warmth and humidity, must have a lid.
Fresh water bowl, must be able to climb in and out.
Salt water bowl, as above.
Food bowl, very shallow.
Spare shell bowl, as above.
Hiding place, old leaves.
Climbing branch.

Twelve to fourteen days later, (about day 40), the most advanced of the juvenile crabs will take over larger shells, about 10mm, and within a week or two more, 15mm shells. These are Stage 5 and now have obvious head coverings, (carapace), and claws and the general appearance of the adult crabs.

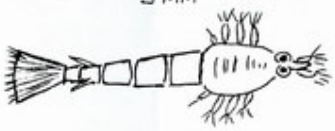
Some of the juvenile crabs are much slower in development than others, so that a selection of shells of various sizes, (5-10-15mm), must always be available to them.

Feeding List:

As with the adults, this is a fairly 'hit and miss' affair.

Stage 1	green water
	marine infusoria
	powdered Spirolina
	brine shrimp food
Stage 2 & 3	any of the above plus
	newly hatched brine shrimp
	frozen fish food, (zooplankton, freshly thawed)
Stage 4	powdered Spirolina
Stage 5 & onwards	powdered baby fish food
	fresh fruit & cooked vegetable pieces
	bread crumbs
	raw crushed peanut
	dried powdered cuttle fish
	etc
plus:	fresh water bowl
	salt water bowl
	old rotting leaves, (not strong scented ones)
	old rotting bark pieces
	mossy rock
	fresh grass, (plant a small patch of canary seed in their container).

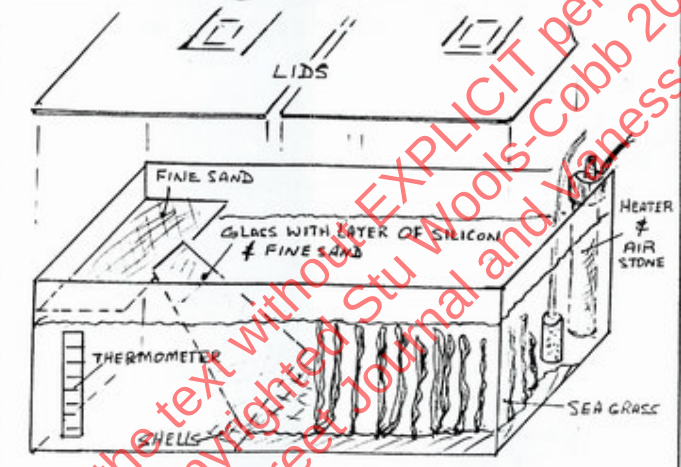
5mm



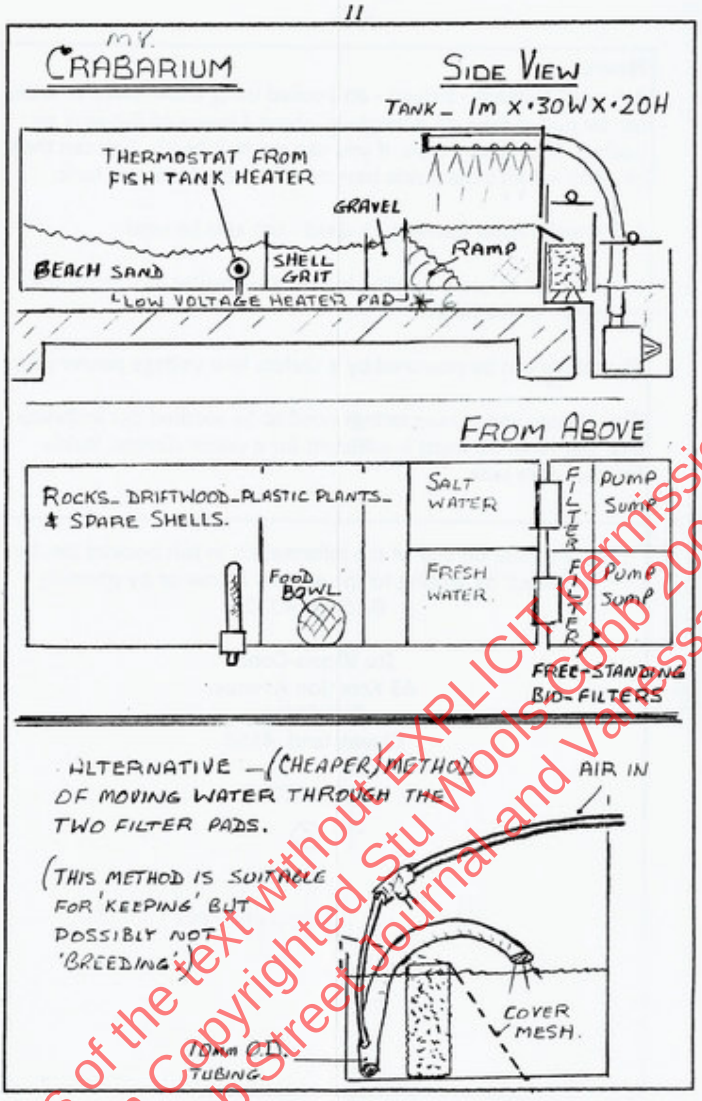
STAGE 1 LARVAE ____ (DAY 2)

7mm

STAGE 2 LARVAE ____ (DAY 9)



SUGGESTED SECOND TANK.



Heater.
A toaster element - halved - and coiled using a thin piece of wire, can be pulled through a length of about 1 metre of fish-tank air tubing. (The silicon type, if you can get it, is best). This can then be siliconed into the inside base middle half of the crab tank.

A fish-tank heater element - halved - can also be used.

It is essential to use a suitably located thermostat to control the operation of the heater.

The above can be powered by a sealed, low voltage power pack.

The voltage and power ratings need to be worked out individually, but 15 to 30 watts is sufficient for a warm climate, inside located, crab tank.

More details on any of the information in this booklet can be obtained by writing to the address below or by phoning 07 5445 4020

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